

REMARKS

Claims 1-4 are pending. Reconsideration and allowance based on the below comments are respectfully requested.

Applicants appreciate the indication of claim 4 as containing allowable subject matter.

The Office Action includes a rejection to the claims based on a Japanese reference Oda, et al. (JP 63-261657). Applicants have provided a translation of Oda with this Response to facilitate an understanding of Oda's teachings and applicant's following arguments.

The Office Action rejects claims 1-3 under 35 U.S.C. §103(a) as being unpatentable over Oda, et al. (JP 63-261657) in view of Hirota, et al. (JP 01-151134). This rejection is respectfully traversed.

Independent claim 1 recites a saddle type coil bobbin, first guide grooves, at least one second guide groove, at least one third guide groove and a multi-wire conductor wound around said coil bobbin to form a coil, wherein said second guide groove and third guide groove have a width and a range of 1.0 to 1.5 times a diameter of said conductor.

Independent claim 3 recites a saddle type coil bobbin, first guide grooves, at least one second guide groove, at least one third guide groove, a multi-wire conductor wound around said saddle type coil bobbin, wherein said at least one second guide groove and said at least one third guide groove have a width in a range of 1.0 to 1.5 times a diameter of said conductor and said conductor being

laid substantially in said first guide grooves, said at least one second guide groove, and said at least one third guide groove.

In the coil bobbin of claims 1 and 3 it is the second and third guide grooves that have a defined claim width of 1.0 to 1.5 times a diameter of the conductor wire. Also, in the recitation of claim 3, the conductor wire is laid in substantially side-by-side in each of the first, second and third guide grooves.

The Office Action alleges that Oda teaches the claimed second and third guide grooves having a width of 1.0 to 1.5 times the diameter of the conductor wire. The Office Action asserts Fig. 3 of Oda provides this teaching of the claimed invention. Applicants respectfully submit, however, that Fig. 3 of Oda refers to guide groove 6 of Oda's coil bobbin. The Office Action has alleged that guide groove 6 corresponds to applicant's claimed first guide groove and that guide grooves 7 correspond to the claimed second and third guide grooves. Thus, based on the interpretation of Oda from the Office Action, Fig. 3 refers to the claimed first guide groove and not applicant's claimed second and third guide grooves. Thus, Fig. 3 of Oda cannot teach the claimed feature of the second and third guide grooves being 1.0 to 1.5 times the diameter of the conductor. Further, nowhere in Oda does it teach or suggest the guide grooves 7 as being 1.0 to 1.5 times the diameter of the conductor.

Further, regarding claim 3, nowhere does Oda teach or suggest laying the conductor wires substantially side-by-side in the second and third guide grooves, as claimed.

Also, Hirota has been applied to only teach the claimed multi-wire conductor limitation of the claims. Hirota fails to make up for Oda's deficient teachings indicated above.

Thus, for the above reasons, the combination of Oda and Hirota fails to teach all the claimed limitations as required. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

For at least these reasons, it is respectfully submitted that claims 1-3 are distinguishable over the cited art. Favorable consideration and prompt allowance are earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad J. Billings (Reg. No. 48,917) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

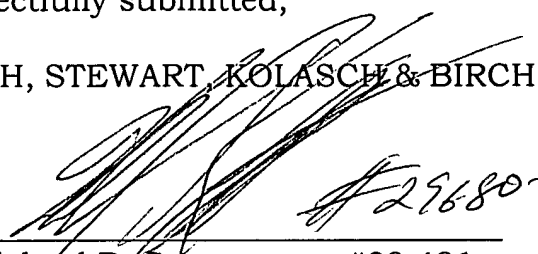
Appl. No. 09/993,619

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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A full translation of Japanese Patent Laid Open No. 63-261657 (Oda et al.)

1. Title of the Invention

Deflection Yoke

2. What is Claimed Is:

A deflection yoke characterized in that
a trumpet-shaped deflection yoke-bobbin has an inner circumferential surface in which a plurality of winding grooves are formed, the winding grooves having a width substantially equal to a diameter of a copper wire or a width substantially equal to a width of a copper wire; and

the copper wire is wound on the yoke in such a way that turns are laid in a multi-layered fashion and are aligned in a line in each of the winding grooves.

3. Detailed Description of the Invention

Technical Field to which the Invention Relates

The present invention relates to a deflection yoke for use with a picture tube applied to, for example, a display.

Conventional Art

Fig. 5 illustrates this type of conventional deflection yoke. A deflection yoke bobbin 1 has winding grooves 2 formed in a trumpet-shaped inner surface and annular winding groove 3 formed on circumferences at both end portions of the winding grooves 2. As shown in Fig. 6, a copper wire 4 is wound irregularly a plurality of times in each of the winding grooves 2.

Problem to be Solved by the Invention

With the conventional deflection yoke of the aforementioned configuration, the turns are laid irregularly with large variations. Therefore, the characteristics of a deflection magnetic field created by the deflection yoke are not consistent, so that the deflection yoke involves bonding of a piece of a magnetic material

and adjusting the rotation of a semi-fixed piece of a magnetic material by trial and error. This is a time-consuming manufacturing process, necessitating unwanted manufacturing time and steps at a factory.

The present invention is to solve the aforementioned problems and provides a deflection yoke in which turns are mounted with minimum variations and high accuracy.

Means for Solving the Problem

In order to solve the aforementioned problems, a deflection yoke according to the present invention is of the configuration in which the width of the respective winding grooves is substantially equal to a diameter of a copper wire or a width of a copper wire, and the turns are laid in a multi-layered fashion to be aligned in a line in each of the winding grooves.

Operation

As described above, laying turns of a copper wire in a multi-layered fashion provides a regular layout of the copper wire in each of the winding grooves. Further, the configuration prevents traversing of the turns when the turns are to be laid in alignment with each other. Thus, the configuration eliminates variation of turns and offers a consistent deflection magnetic field, yielding a highly accurate deflection yoke.

Embodiment

An embodiment of the invention will be described with reference to the drawings.

Fig. 1 and Fig. 2 illustrate a deflection yoke bobbin 5 for a stator winding according to an embodiment of the invention. The deflection yoke bobbin has winding grooves 6 formed in an inner circumferential surface and winding grooves 7 on circumferences at both ends of the winding grooves 6 so that the turns of wire are wound in the winding grooves 6 and the winding grooves 7. As shown in Fig. 3 and Fig. 4, the winding grooves 6 formed in the inner circumferential surface have a width substantially equal to the diameter of a copper wire if the copper wire has a circular

cross-section, and substantially equal to the width of a copper wire if the copper wire has a rectangular cross section. The turns of wires 7 (*translator's note: "7" should read "8"*) and 9 are wound on the deflection yoke bobbin 5 in such a manner that the turns are laid one over the other in a multi-layer fashion to be aligned in a line. Winding the copper wires 8 and 9 in such a manner that the turns are laid one over the other in a multi-layer fashion allows the wires 8 and 9 to be laid in the winding grooves 6 regularly. This provides a consistent distribution of deflection magnetic field and improves the accuracy of the deflection yoke.

Advantages of the Invention

As described above, in the present invention, the wire is wound in such a way that the turns are laid in a multi-layer fashion to be aligned in a line in each of winding grooves. Therefore, this way of winding greatly reduces variation in winding a deflection coil and inconsistency of distribution of the deflection magnetic field that is used to deflect an electron beam for a picture tube. Thus, the configuration of the invention provides deflection yokes having highly consistent characteristics and is valuable from a point of view of industrial applications.

4. Brief Description of the Drawings

Fig. 1 is a top view of a deflection yoke bobbin for a deflection yoke according to an embodiment of the invention.

Fig. 2 is a cross-sectional view of Fig. 1.

Fig. 3 and Fig. 4 are cross-sectional views illustrating turns of the deflection coil according to the embodiment.

Fig. 5 is a perspective view of a conventional bobbin on which a deflection coil is wound.

Fig. 6 is a cross-sectional view illustrating turns of the conventional deflection coil.

5: deflection yoke bobbin, 6: winding grooves formed in an inner circumferential surface, 7: winding grooves on circumferences, 8: copper wire, 9: copper wire (with a rectangular cross section).